REMARKS

Claims 19-24 are pending in this application. Claims 19-24 are rejected. Claims 19, 23 and 24 have been amended herein. Attached hereto is a marked-up version of the changes made by the current amendment, captioned "Version with Markings to Show Changes Made."

Claim Rejections under 35 U.S.C. §103(a)

Claims 19-24 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,900,852 to Tanaka et al., in view of U.S. Patent No. 5,532,713 to Okada et al.

The Examiner asserts that it would have been obvious to set a reset term during which all the pixel electrodes closed by applying voltage to the pixel electrodes before the scan term as shown by Okada et al. in order to reset the display states of all pixels (see col. 8, lines 5-8).

Applicants herein amend claims 19, 23 and 24 to show all the structure in the preamble of the claims, and to more clearly define the claims as method claims.

Applicants respectfully disagree with the above rejection, because the Examiner has not stated a motivation or suggestion to combine the cited references, and furthermore, Applicants submit that the cited references, even if combined, do not teach or suggest all the elements of the invention.

The Examiner asserts that Tanaka et al. disclose the method of driving a liquid crystal shutter comprising the step of setting a scan term for driving pixel electrodes so that the scan term becomes shorter than the holding time (Fig. 2).

However, according to col. 10, lines 32-40 of Tanaka, Fig. 2 only shows that the selection time period t_{01}, t_{02} which are the terms for applying the voltage for changing the bright and dark status of the display are shorter than the frame status t_1, $t_{1'}$, which are the scan time required for one screen of data.

Applicants note that Tanaka does not disclose a holding time during which a liquid crystal shutter keeps a maximum transmittance higher than a transmittance in an initial open state. Therefore, there is no teaching or suggestion of setting the scan term shorter than the holding time.

Applicants note that Okada et al. describes in col. 8, lines 3-8 that the scanning signals include a clear pulse or resetting the display states of all pixels on a selected scanning line.

However, it is not the feature of the present invention to merely provide a reset term and set a selection time period shorter than a frame term. Applicants note that the present invention utilizes the characteristic that the intended liquid crystal shutter have a maximum transmittance higher than a transmittance in an initial open state for a while when the pixels change from the closed state to opened state, and keeps the maximum transmittance for a certain time (it is called as a holding time), and then turns to the initial open state,

Consequently the scan term during which pixels are rendered opened or closed is set for the aforementioned holding time, i.e., during the period of maximum transmittance (shorter than the holding time), thereby actualizing the opening and closing state in high contrast.

Even the combination of the techniques disclosed in Tanaka and Okada does not result in such a technique. Therefore, Applicants submit that the invention in present claims 19-24 would not have been obvious to one skilled in the art at the time of the invention.

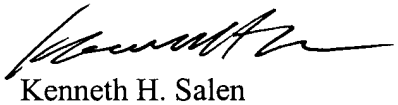
For at least the above reasons, Applicants respectfully submit that the present invention is patentably distinct from the cited references. Withdrawal of the rejections and passage of the claims to issue are earnestly requested.

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees that may be due with respect to this paper to Deposit Account No. 01-2340.

Respectfully submitted,

ARMSTRONG, WESTERMAN & HATTORI, LLP



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Enclosures: Version with Markings to Show Changes Made
Request for Approval of Drawing Changes

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Please amend claims 19, 23 and 24 as follows:

19. (Amended) A method of driving a liquid crystal shutter ~~including~~, comprising the steps of:

providing a liquid crystal shutter including a nematic liquid crystal having a twisted angle equal to or greater than 180° sandwiched between a pair of substrates~~;~~ , and pixels;

~~which demonstrates an initial opened state at no applied voltage after another opened state exhibiting maximum transmittance higher than a transmittance in said initial opened state when voltage applied to said pixels is turned off, said method comprising steps of:~~

setting a scan term during which said pixels are rendered opened or closed such that said scan term is shorter than a holding time during which said liquid crystal shutter keeps ~~said~~ a maximum transmittance; and

setting a reset term during which all said pixels are rendered closed by applying voltage to all said pixels before said scan term ;

wherein said pixels demonstrate an initial opened state at no applied voltage after another opened state exhibiting said maximum transmittance higher than a transmittance in said initial opened state when voltage applied to said pixels is turned off.

23. (Amended) A method of driving a liquid crystal shutter ~~including~~, comprising the steps of:

providing a liquid crystal shutter including a nematic liquid crystal having a twisted angle equal to or greater than 180° sandwiched between a pair of substrates; a pair of polarizing plates having respective absorption axes which are substantially orthogonal to each other and angled within a range of ±40° to ±50° relative to a direction in which intermediate liquid crystal molecules are oriented ~~,~~ , and pixels ; ~~, which demonstrates an initial opened state at no applied voltage after another opened state exhibiting maximum transmittance higher than a transmittance in said initial opened state when voltage applied to said pixels is turned off, said method comprising steps of:~~

setting a scan term during which said pixels are rendered opened or closed such that said scan term is shorter than a holding time during which said liquid crystal shutter keeps ~~said~~ a maximum transmittance; and

setting a reset term during which all said pixels are rendered closed by applying voltage to all said pixels before said scan term ;

wherein said pixels demonstrate an initial opened state at no applied voltage after another opened state exhibiting said maximum transmittance higher than a transmittance in said initial opened state when voltage applied to said pixels is turned off.

24. (Amended) A method of driving a liquid crystal shutter ~~including~~, comprising the steps of:

providing a liquid crystal shutter including a nematic liquid crystal having a twisted angle equal to or greater than 180° sandwiched between a pair of substrates; a pair of polarizing plates having respective absorption axes which are substantially orthogonal to each other ~~,~~ , and pixels ~~,~~ ~~, which demonstrates an initial opened state at no applied voltage after another opened state exhibiting maximum transmittance higher than transmittance in said initial opened state when voltage applied to said pixels is turned off, and wherein Δnd value lies within a range of 600 to 900 nm, said Δnd value being a product of a birefringence Δn of said nematic liquid crystal and a gap d between said pair of substrates, said method comprising steps of:~~

setting a scan term during which said pixels are rendered opened or closed such that said scan term is shorter than a holding time during which said liquid crystal shutter keeps ~~said~~ a maximum transmittance; and

setting a reset term during which all said pixels are rendered closed by applying voltage to all said pixels before said scan term ;

wherein said pixels demonstrate an initial opened state at no applied voltage after another opened state exhibiting said maximum transmittance higher than transmittance in said initial opened state when voltage applied to said pixels is turned off, and wherein Δnd value lies within a range of 600 to 900 nm, said Δnd value being a product of a birefringence Δn of said nematic liquid crystal and a gap d between said pair of substrates.